

## REMARKS

The last Office Action has been carefully considered.

It is noted Claims 1 and 4 are rejected under 35 USC 102 (b) over the U.S. patent to Baggermans.

Claims 2-3 and 5-6 are rejected 35 USC 103(a) over the U.S. patent to Baggermans in view of the U.S. patent to Nichols.

Also, some claims are rejected under 35 USC 112.

It is believed to be advisable to attend first to the Examiner's grounds for the formal rejection of the claims under 35 USC 112.

Turning now to the Examiner's grounds for rejection of the claims for formal reasons under 35 USC 112, it is respectfully submitted that with respect to Page 2, first section, the meaning of "the opposite sense of winding" is clearly disclosed at page 3, line 29 through page 4, line 4. If a disc material is wound around a core, only two senses of winding are possible. If both discs have the same sense of winding then the electrical current must e.g. flow in Fig. 3 of the application from the outer sides to the inner sides of both discs in order to generate the same magnetic field in core 301. As a result thereof the disadvantages

mentioned at page 3, lines 30-33 will result, i.e. one terminal must be provided at the core and, if two separate sources for the current are to be avoided, also a connection line between the layers 150 and 151 is necessary. If, however, the layers have an opposite sense of winding then it is possible to connect the inner sides of both windings and provide the outer sides of both windings with a terminal 319, 320 as shown in Fig. 3 of the application.

It is therefore respectfully submitted that the expression "opposite sense" is well disclosed in the specification and drawings of the present application. Apart from the above, the expressions "same" or "opposite" sense of winding are generally known in the art of producing a winding. Claim 2 has been amended to make clear that the conductor strips of one disc are wound in an opposite sense with respect to the conductor strips of a neighbored disc.

The meaning of the phrase "thickness that is chosen depending on the voltage maximally occurring between two layers of both discs" is disclosed at page 4, third paragraph. If the conductor strips are wound in an opposite sense according e.g. to Fig. 3 of the application, then the current enters e.g. through terminal 319 and leave the pole at terminal 320. As a result thereof, the electrical voltage is maximum (e.g.

500 V) between both terminals 319 and 320, and the second insulation layer 317 must, therefore, be adapted to withstand this maximum voltage.

If, however, the conductor strips are wound in a same sense, then the current enters e.g. at terminal 319, flows through the first disc, then through an additional connection to terminal 320 and from there through the second disc (see page 3, line 29 through page 4, line 4). In this case, the voltage difference between the outermost layers is much smaller, and the maximum voltage is half as great as the maximum voltage in the first example (i.e. e.g. 250 V between all pairs 1, 151 2, 152... up to 150, 300). Thus, in the second example a far weaker insulation layer can be provided.

Claim 5 is, therefore, intended to say that the thickness of the second insulation layer 317 must be chosen in accordance with the maximum voltages between two neighbored layers of the two (or more) discs.

The word “substantially” has been cancelled from Claim 4. However, new Claims 8 and 9 include the word “substantially”. This is necessary because it is not possible to guarantee exactly the same magnetic flux and/or space requirement for the pole according to the

invention in comparison with a known pole having only one disc (see e.g. page 4, third paragraph of the present invention).

It is believed therefore that the Examiner's grounds for the formal rejection of the claims under 35 USC 112 should be considered as no longer tenable and should be withdrawn.

Turning now to the Examiner's rejection of the claims as being anticipated by the U.S. patent to Baggermans, it is respectfully submitted that it is correct that Baggermans (US 4 086 552) discloses a core having two discs thereon, wherein each coil structure includes conductor strips insulated from each other by a first insulating layer, wherein both discs are separated by a second insulating layer, and wherein both discs may have the same number of coils. It is, however, to point out that the reference is directed to a line transformer having a closed core as shown in Figs. 1 and 2 of the Baggermans patent, whereas the invention is directed to the core of a magnetic pole, which core has, therefore, at least one open end face. Baggermans can, therefore, not anticipate the invention as claimed because Baggermans is directed to another subject matter as compared with the invention.

It is, however, also deemed that Baggermans can not make obvious the claimed invention. According e.g. to the first line of the

Abstract of the Baggermans patent, a low-voltage winding of a line transformer is described, and it is desired to tune the line transformer to the third and fifth harmonic by making possible an adjustment of the coupling factor by sliding the high-voltage (secondary) winding with respect to the low-voltage (primary) winding in a particular manner (see e.g. column 2, lines 36-40 and lines 49-53). The embodiment according to Fig. 2 of the Baggermans patent only has the advantage that a more precise tuning is possible because there are two edges adjoining the gap between the two discs, each edge building up a stray field as compared with only one edge in Fig. 1.

Because the primary winding is a low-voltage winding and because the transformer is a line transformer for a television receiver of the like, there is no need for cooling means whatsoever. It is particularly not necessary to select the distance between the two discs in Fig. 2 of Baggermans in dependence upon the magnetic flux or space requirements with respect to the Fig. 1 embodiment of Baggermans. Apart from this, the distance between the two discs obviously is selected in dependence upon the desired stray effects and the changes being possible by sliding the secondary winding along the two primary discs but not in dependence upon magnetic flux or space. Thus, the purpose of the known transformer is also quite a different one as the purpose of the magnetic pole of the present invention.

The magnetic pole of new Claim 7 serves to bring the vehicle into a levitated condition during movement along a track, and because magnetic levitation vehicles are very heavy (e.g. 50 t and more) it is necessary to provide high-power carrying magnets, such that large currents must be fed through the windings of the magnetic poles. Magnetic poles for magnetic levitation vehicles are operated e.g. with 480V and 80A. The problem of cooling, therefore, arises as mentioned at page 1, lines 10-15, and this is the reason that most of the heat generated in the windings must be dissipated by means of the core. This is, however, only possible if the heat can penetrate all layers of the windings in a radial direction (see also page 3, lines 1-27 and in particular page 5, second paragraph of the specification). It follows that the reason for providing the magnet pole of the present invention with more than one discs is a different one than as described for the line transformer in the Baggermans citation.

It is deemed, therefore, that the construction of a transformer having two low-voltage primary discs in order to tune the transformer can not make obvious to provide a magnetic pole of a magnetic levitation vehicle with two or more discs in order to solve the cooling problem. With other words, according to applicant's opinion the Baggermans patent can not make obvious to provide a magnet pole of a magnetic levitation vehicle with two or more discs, because no expert for transportation

systems will ever look into documents relating to television and to use a means used in the television technique for quite another purpose also for a magnetic levitation vehicle.

New Claim 8 contains a patentable subject matter per se. Nothing is disclosed in the Baggermans patent with respect to magnetic flux and space requirement and particularly to the selection of the height and thickness of the conductor strips of the windings. A further particular advantage of the invention is insofar that known magnetic poles of a levitation vehicle having only one disc can simply be replaced by magnetic pole as claimed in this application because there are no important changes in magnetic flux and space such that no new construction for the vehicle is necessary if the magnet poles as claimed are to be used also for magnetic levitation vehicles already being in use.

New Claim 9 is similar to new Claim 8 and is directed to a pole having more than two discs as e.g. disclosed at page 3, line 11-15 of the specification. Its features are also not disclosed in the Baggermans patent.

The patent to Nichols (US 3 086 184) has only been mentioned with respect to Claims 2 and 3. The Examiner gives, however, no reason for his argument that Nichols makes obvious the opposite

sense of the discs and the use of all terminals at the outermost layers. Nothing in Nichols even gives a hint with respect to Claims 2 and 3. Apart from this, also Nichols discloses a transformer (see e.g. column 2, line 71), and the transformer core has only one disc such that automatically one terminal is at the outermost layer and the other one at the innermost layer. It is, therefore, not understood why it is obvious to have both terminals at the outside in case that two (or more) discs are used. And if only one disc is provided, there is no need for the “opposite sense” of winding.

It is further to note that Nichols suggest to use spacers 9 in order to provide channels between the conductor strips (layers) of the discs through which channels of cooling media as e.g. oil or air can be circulated (see column 4, lines 57-61 of Nichols). Thus, the means for cooling disclosed by Nichols can not be compared with the type of cooling suggested by the present application.

Summarizing, neither Baggermans or Nichols alone nor both in combination can make obvious the subject matter according to the claims of the present application.

In view of the above presented remarks and amendments, it is believed that Claims 7, 8 and 9 should be considered as patentably distinguishing over the art and should be allowed.

As for the dependent claims, these claims depend on Claim 7, they share its allowable features, and therefore it is respectfully submitted that they should be allowed as well.

Reconsideration and allowance of the present application is most respectfully requested.

Should the Examiner require or consider it advisable that the specification, claims and/or drawings be further amended or corrected in formal respects in order to place this case in condition for final allowance, then it is respectfully requested that such amendments or corrections be carried out by Examiner's Amendment, and the case be passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing this case to allowance; he is invited to telephone the undersigned (at 631-549-4700).

Respectfully submitted,



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